Vol. 2 September 1938 No. 4



# The EXTENSION ENTOMOLOGIST

The annual reports of the extension entomologists have long since been received, but the reviewing has just been completed. The reports are chock full of information on insect pests, how they were controlled, methods used to get the information before the public, and the great number of people who have been helped. It is unfortunate that more entomologists do not have an opportunity to read these most interesting reports, and since it is impossible to copy them in toto, excerpts from some have been copied for this issue. More excerpts will be included in later issues. Those used in this issue show the various methods employed to get control measures, for different groups of insects, adopted.

Many of the timely topics may not be new to members of the Bureau of Entomology and Plant Quarantine, but are being copied here for the benefit of the people outside the Bureau who receive this publication. The cooperation of the leaders in the Bureau is very much appreciated, and to them credit is due for permission to use the timely topics on recent research in their Divisions.

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Extension Entomologist

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

CONTENTS

# THE EXTENSION ENTOMOLOGIST

## ANNOUNCEMENTS

There comes a time each year when entomologists in various lines of work like to compare notes. For this reason, a number of meetings are arranged. That plans may be made for attendance at these meetings, the time and place of some of the meetings are listed:

### November 17-18

Baltimore, Md., possibly at the Lord Baltimore Hotel, the Eastern Branch of the American Association of Economic Entomologists.

### November 26

Waynesboro, Pa., Anthony Wayne Hotel, Cumberland-Shenandoah Fruit Conference.

### December 26-30

Richmond, Va., John Marshall Hotel, American Association of Economic Entomologists of the American Association for the Advancement of Science.

## EXTENSION FRUIT AND VEGETABLE SCHOOLS IN OHIO

Extension specialists in Ohio cooperated in a series of schools held in the counties in order to call more forcefully to the attention of fruit and vegetable growers the need for applying approved methods for fruit and vegetable production.

At first the schools were tried in a few counties. The extension horticulturist took charge of four sessions; the extension entomologist had one session, and the extension plant pathologist one. Gradually workers in other departments became interested in taking sessions, and in some cases experiment station workers have been used. The extension agronomist has cooperated by giving lessons on soil management. Rural economic workers have cooperated by giving lessons on keeping orchard accounts and on phases of marketing. Agricultural engineering has cooperated, with a lesson on sprayers, and with a clinic on the use and care of spray machinery. The extension horticulturist's lessons covered the usual recognized horticultural phases of extension work, such as pruning, fruit thinning, tree growth and fruit-bud formation, varieties, pollination and fruit setting, winter injury, and use of hardy understocks, storage construction and management, varietal responses to cultural and handling practices, fruit-crop outlook, and fruit marketing.

The entomologist has fitted into these fruit schools very well and alters his talk at each meeting to fit the needs of the growers in the community. Where codling moth is not a problem, it is not discussed. Where it is a serious problem, it takes a large share of the time. Likewise, the

plant pathologist alters his talk to cover the most prevalent diseases in the area.

The schools are now four sessions long and are held 1 week apart. At the end of the four meetings the fruit growers have had a well-rounded-out series and have been handed mimeographed reports and notes, which they have taken home. These have been prepared by each member of the staff who appeared.

Frequently, splendid use is made of county horticultural societies and other local organizations in assisting the county agent to secure the proper build-up for the school. Local organizations have cooperated with county fruit committees in expressing their interest in the type of material wanted at the school. This has helped to adapt lesson material to the needs and interests in the counties where the schools were given, and they were given primarily for commercial fruit growers, although Smith-Hughes teachers and their students are welcome and frequently attend.

The discussion method of teaching has been quite widely followed in handling the various sessions. Illustrative material of various kinds has been used, such as charts, diagrams, lantern slides, film strips, and various types of exhibit materials and photographs. It has been found very helpful indeed to use all visual aids that are applicable to the material presented.

Where it has been advisable to request other adjacent counties to cooperate with the fruit school, the county agent is encouraged to cooperate fully with the extension agents in the adjacent counties so they will do the necessary contact and follow-up work to secure the interest and attendance of fruit growers from their counties.

The same plan has been adopted for vegetable counties. However, the attendance at the vegetable meetings has not been as consistently good as at the fruit meetings. Most of them are well attended, but a few are poorly attended.

At the vegetable meetings, the insecticide dealers are sometimes invited and are present. Periodically the extension entomologist has been meeting with the insecticide dealers where subject matter has been presented more in line with their needs. The vegetable-gardening specialist cooperates in giving the vegetable schools, most of which are four sessions long. They are held every other year in the same community, and give way to a 1-day vegetable meeting in the alternate year.

The 4-day vegetable and fruit schools permit of more detailed instruction and participation on the part of the growers than can come out of a 1-day meeting. This type of school is very popular with the growers. There is some difficulty in keeping the same community from insisting on being served in this manner year after year.

## EXCERPTS FROM ANNUAL REPORTS

### 4-H Insect Club Work

Considerable progress was made in 4-H insect-club work during 1937, both as to the quality of work and the number enrolled. The enrollment was increased by years as follows:

1935 - 1,242
1936 - 2,510
1937 - 3,414

This shows that this is a live and growing club. We have been able to devote considerable time to this project early in the season and also late in the fall. Four-H insect club enrollment is State-wide, 68 counties out of the State's 77 counties having members enrolled in this club.

Boys and girls are realizing that if they have to farm, they must have some information on insect control. Boys and girls from the smaller cities are also enrolling in this line of work, as it is impossible for some of them to carry on other projects.

During the winter months, I visited the 4-H Clubs of 17 counties. At each of these meetings, a cigar box showing the proper method of mounting and labeling insects was shown the 4-H Club members, and instructions were given in making the killing bottles and nets. A few of the club members were assisted in labeling their insects at these meetings.

At two of four 4-H training schools, I discussed the best methods of mounting and labeling insects and how to prepare killing bottles and nets.

At the 4-H Club round-up held in Stillwater the first week in August, we gave a short course for those enrolled in entomology. There were 45 enrolled in this short course, and it was well attended. Team demonstrations were very good this year, and there were 14 teams entered.

The 4-H insect-club manual was revised and printed during November, and we are printing 15,000 copies, which should be enough to last us 2 years.

### Entomology Short Course Program

For 4-H Club Members

State 4-H Round-Up - August 10-13, 1937
A. & M. College, Stillwater, Oklahoma.

Place of meeting: Northwest District Tent.

Instructors:

C. F. Stiles, extension entomologist
J. Myron Maxwell, assistant extension entomologist

F. A. Fenton, head of entomology department
C. E. Sanborn, professor emeritus of entomology
F. E. Whitehead, assistant professor of entomology
G. H. Bieberdorf, assistant professor of entomology
Ephriam Hixson, assistant professor of entomology

Tuesday, August 10

9:00 - 11:30 a.m. Team demonstrations
1:00 - 5:00 p.m. Team demonstrations

Wednesday, August 11

9:00 - 9:40 a.m. Tree-borer control - F. A. Fenton
9:50 - 11:30 a.m. Some insect friends - Ephriam Hixson

Thursday, August 12

9:00 - 9:40 a.m. Mounting insects for the fair exhibit - C. F. Stiles and J. Myron Maxwell
9:50 - 11:30 a.m. Laboratory and field trip - C. E. Sanborn

Friday, August 13

9:00 - 9:40 a.m. Grasshoppers - F. E. Whitehead
9:50 - 11:30 a.m. Lecture and field trip - G. H. Bieberdorf

The insect exhibit at the fairs this year was the best that we have on record. At the Oklahoma City fair there were 38 entries, at the Tulsa fair 20, and at Muskogee 19. Some of the exhibits were as good as any student in entomology could prepare, but of course not all of them were correctly identified.

The extension entomologist offered two trips to the American Royal Livestock Show in Kansas City for the boy and girl who submitted the best all-round record in 4-H insect-club work. A story of their 4-H insect-club work had to be submitted before October 10 in order to be awarded the trip. First place went to Katie Lou Adams of Garvin County and second place to Vera Schoonover of Caddo County. Both the girls made the trip to Kansas City, and the following reports were submitted:

My Insect Story

When our county home demonstration agent came to our club meeting and was telling us about the new project on insects, I became interested. She told us about the requirements of the first year in insects, but failed to make it clear if it was for the boys or girls. I asked myself whether to ask her who could join or not. I first said "No," that it was for the boys who took crops and wanted to find out how to control the insects, and then I said that girls cultivate gardens and they needed to know how to control insects also. Finally when she had finished I asked her who could join.

She said that both boys and girls could join. I joined the insect club that day, Tuesday, November 12, 1934 and set my goal to strive to have the best insect collection in the county and if possible in the State.

That fall and winter I found the study of insects rather boresome because there were not any insects out and all I could do was to study about the different kinds of insects from a book.

That spring when I thought my cabbage should begin to grow, they just stood there and turned white. One day I was looking at them and discovered that they were covered with little black lice. I read my manual on insects, and it told me to spray my cabbage with nicotine sulphate. I did this, and my cabbage began to grow immediately. Mrs. Raymond Harper, one of my neighbors, was having the same trouble with her cabbage, and I demonstrated to her how to spray her cabbage.

When school took up the first summer of my insect study, I made an insect net from a broom handle and a meal sack. I would put my insects in a bottle and kill them by dropping a little gasoline on them. Every day at noon for 2 weeks all the insect-club members went on a tour with our coach, Mrs. Robert Shirley, to catch insects for our exhibit. It was during one of these tours that the picture was made.

I reached my first year's goal that fall by winning first prize of $1 at the Garvin County Fair. I had seven competitors in the county. There were three insect boxes to go to the State fair, mine being one of them. Gene Edwards and Bob Rodke from Garvin County won first and second, and I was third in the State, making me a total of $1.75 on my first year's work in insects, besides the knowledge gained.

After my first year in the insect club, it wasn't necessary to encourage me to join again, because I knew then that it was beneficial.

During my second year of insect work, I was captain of three original demonstrations. They were:

1. "Killing and Mounting Insects for Exhibits," presented to the 4-H Club members, at which time the picture on demonstration work was taken.

2. "Controlling the Housefly," presented to the farm women's club in the home of Mrs. E. P. Warren.

3. "Controlling the Colorado Potato Beetle," presented to the 4-H members and their parents.

During the research work on the potato beetle I made a new and important discovery, or at least it was to me. I had always been under the impression that there were two kinds of Colorado potato beetle that ate the potatoes. There was the red soft potato bug, and the black-and-yellow-striped, hard-shelled potato bug. But I found that my vegetable spray calendar said that the potato beetle went through a complete metamorphosis and

red soft insect was just the larva of the potato beetle. The red bug goes into the ground, grows wings, puts on a shield, then comes out and lays more eggs to hatch.

When the potato beetle got bad on our potato vines that spring, I demonstrated to daddy the 4-H way of spraying the potato vines with arsenate of lead. He liked it fine and has used it ever since.

For my second year's work I prepared a cyanide killing bottle and killed and mounted 50 insects. I won first prize of $1 in the county and first prize of $3 in the State on my second insect box. That made me $4 on that year of work.

The use of cellophane over the top of the box was originated in Garvin County, and I was the first one to use it in the State. It was later taken up by the State department and is now a requirement in the manual.

At the beginning of my third year in insect work I collected six cotton squares which had fallen on the ground, in a glass jar and kept them in a damp warm place, and raised five young boll weevils to adult weevils.

I wrote and presented a demonstration on "Dusting Chickens With Sodium Fluoride for Lice" (pinch method) to the 4-H members and parents of Union Springs. I helped my mother spray our chicken house twice with carbolineum to get rid of chicken mites. We do not have lice or mites on our farm now.

I lent a box I made for my 50-insect exhibit in the second year to Dorothy Goodman and helped the first-year members identify their insects. It is a pleasure to encourage younger members in so interesting a project.

I never knew until this year's study of insects that there were two groups of insects; those with biting or chewing mouth parts and those with sucking mouth parts. There are two kinds of insecticides used to kill these two different kinds of insects. They either kill by coming in contact with the insect, or the insect swallows the poison and it kills him as a stomach poison.

I caught, killed, and mounted 100 insects for my insect exhibit. They were not all very common to me, so I wrote to the University of Oklahoma for educational material to help me out. With that and the assistance I received from the county agent's office and the personal assistance I received from Mr. C. F. Stiles, extension entomologist, I succeeded in mounting and naming my 100 insects for exhibit. I won first in Garvin County and second in the State fair on my third-year insect exhibit. This makes me a total of $8.75 for my 3 years' work in insects. However, I gained more knowledge from my work than money could ever pay.

I am a junior in high school, and the information I have gained from 3 years' study and personal assistance received from Mr. C. F. Stiles, extension entomologist, will be beneficial in my biological science studies in high school or college.

When the State inspector visited our school in 1936, he complimented my insect box that was on display in the laboratory.

I gave a total of six original insect demonstrations to a total attendance of 200 people.

--Katie Lou Adams
Union Springs 4-H Club

The following are some comments made by a few of the counties:

Murray County--"Fifty-five boys and fifty-four girls are enrolled in insect-club work. The members are required to collect and classify the insects. All have been given instructions on collecting and mounting the different kinds of insects. They are also taught to distinguish the harmful and beneficial insects and how to control them. The boys and girls are taking a lot of interest in the work.

This year the club members took an active part in insect-control program in the county. We had some very good collections at the county fair this year. The work has been valuable to the county this year on account of the heavy outbreak of different insects. We have had the members make grasshopper surveys this fall, and find that there is a large number of eggs deposited in parts of the county."

Sewell G. Skelton, assistant county agent:

"Active entomology work was inspired by the program held at camp Parthenia when county 4-H Club members came together for the annual 4-H Club camp. Sixty-five cigar boxes were collected at odd times by the assistant county agent to be used as exhibit boxes for insects collected by club members. Mr. J. Myron Maxwell, assistant extension entomologist, was present at the camp to give instructions on collecting and mounting. One morning session was spent by Mr. Maxwell in teaching the group to prepare exhibit boxes and how to identify and mount specimens collected. The afternoon session consisted of an insect tour. There were 251 specimens collected on this tour, after which they were mounted. Every one of the 52 individuals had a few insects to start his exhibit. The assistant county agent purchased 500 insect pins and distributed them among the club members. Additional work was done by the club members on their insect exhibit before fair time. However, only one individual, Shirley Lynch, had a complete box with 25 different insects."

--Annual report in entomology.
1937. Oklahoma.

## Soil-Conservation Activities in Entomology

Several visits were made to the soil-conservation demonstration area near Benton Harbor, Mich. Visits were made to several of the cooperators' farms on each occasion, and various insect problems were encountered and discussed with the cooperators and the soil-conservation personnel. No meetings were

necessary in connection with the problems encountered in the conservation--demonstration area.

Some of the visits made to this area were in connection with a special problem. The planting of young fruit trees in certain types of ground cover, namely, legumes, without putting the ground completely under cultivation, gives rise to damage by treehoppers. Observations were started during the early part of the season, in connection with the treehopper damage on young and old peach trees, and were conducted by Mr. O'Brien of the Soil Conservation Service throughout the season. The extension specialist visited the locations on which the observations were being made at three times during the season and made suggestions as to the type of information it might be desirable to secure from observations made in these orchards.

Cooperation with Farm Security Administration:

Several consultations have been held with members of what is now the Farm Security Administration staff in the State. Recommendations have been made to them for meeting insect problems in connection with their work in both the Lower and Upper Peninsulas.

Two ladies' groups from the staff of this organization were met by Professor E. I. McDaniel for the discussion of household-insect problems in one instance and garden insects at a later date.

Contacts with Resettlement cooperators and administrators in connection with the grasshopper-control program were made frequently. These contacts were made usually through the county agricultural agent or the local grasshopper-control organization.

--Annual Report, Insect Congrol
Project. 1937. Michigan.

## Livestock Parasite Control

Horse bots and botflies.

The work in this subdivision was carried on in a limited way in 1933 and 1935. Demand increased to such an extent that it was carried on in 15 counties in 1936, and approximately 10,000 head of horses and mules were treated. The results were so satisfactory that demands for the work came from two-thirds of the counties of the State in 1937.

A circular on organizing and conducting a horse-bot-control campaign was prepared in the fall of 1936, and was used throughout the 1937 campaign. The work was carried on cooperatively by the extension entomologist and the extension animal husbandmen. Counties in which interest seemed to be general were organized by precincts or neighborhoods, with a committee of farmers to push the work in each precinct or neighborhood. Precinct meetings were held where it seemed advisable, and all farmers were contacted and the work explained to them. The county agent supervised the campaign. Cooperation of

veterinarians was secured, and the work was done by them, and necessary materials were furnished at a reduced rate. A definite schedule for the work was made out, and each farmer had his horses and mules ready for the treatment at a stated time. The veterinarian then made the scheduled trip and administered the treatment. Where interest was not general in a county, the work was confined to precincts or neighborhoods where most interest was manifest.

Eighteen counties carried on well-organized work, and it was tried on a limited scale in 45 others. A total of 41,777 head of horses and mules, belonging to 7,528 farmers, were treated at an average cost of 34 cents per head. Results were generally satisfactory, with many farmers stating that they felt the results were worth $5 per head. Platte County led with a total of 5,314 horses and mules treated.

Every effort was made to have all treatment administered by a qualified veterinarian, but in a few counties the farmers depended upon laymen to do the work. This showed up in a startling manner in mortality records. Where the work was done by a veterinarian, the losses were negligible, only three horses being reported lost out of 36,000 head. In 2 of these cases it seemed very likely that the death of the animals was due to some other cause. However, out of approximately 6,000 head treated by laymen, 12 head were reported as lost.

The goal in this subdivision was to have organized horse-bot-control work carried on in 20 counties and have 20,000 head of horses and mules treated. This goal was exceeded more than 2 to 1. Interest in the work is high, and it will be increased, if possible, in 1938. However, financial conditions over three-quarters of the State are such that any noticeable increase seems to be very doubtful.

--Annual Report in Entomology.
1937. Nebraska.

## Ox Warble Control

The ox-warble control in Kansas was continued during the past 2 years, even though other phases of the project were emphasized. The demonstrations of several years ago proved the value of the removal of the grubs, and the control of the insect has not been forgotten by 1,865 farmers in 42 counties who treated 9,020 animals. This phase has been emphasized for many years and the control of the pest proved many times. The growers have learned that the buyers look at the number of warbles in the backs of the animals during December to March and that they pay less for the animals which have grubs. These facts come to the entomologist many times during the season.

While on beef-cattle tours in August, the entomologist pointed out these facts to many growers who had not attended previous meetings. A representative of the Producers' Commission Association, a cattle-buying organization of the Kansas City Stockyards, was on the tour to drum up good will.

--Annual Report in Entomology.
1937. Kansas.

## Sticktight Flea, or Chicken Flea

The heaviest infestation of the sticktight flea, or chicken flea, ever witnessed by the writer was observed on the premises of E. O. Barnes' farm in Nash County. Fleas were breeding in the chickenyard, mule stables, harness shed, dog houses, and around the doorway and under the flooring of the feed barn. All the domestic animals on the farm were infested, and persons walking in the chickenyard and in the mule lot in the vicinity of the barns and stables would be viciously attacked by the pests. The conditions were becoming unbearable for all animal life. Hired help on the farm had threatened to leave if the fleas were not eradicated. The extension entomologist and the county agent were called upon to supervise the task of eradicating these pests.

Methods and results.

Tar gas oil, diluted with kerosene, was sprayed over the ground in every locality where the fleas were found, including the stables, harness shed, chicken houses, chickenyards, mule lots, dog houses, and around the borders of and under the flooring of the feed barn. All the domestic animals, with the exception of poultry, were immediately treated with a creosote spray preparation. Infestations on the poultry flock were treated with carbolated vaseline. This treatment apparently eradicated the fleas in one application.

--Annual Report in Entomology.
1937. North Carolina.

## Truck and Garden Crops

The work in insect control with these crops could well require full time of one man, but such is not possible. A great deal of the work has to be done by the county agent. The project leader through conferences and district meetings trains the agents in the work. Steady progress in the work is being made. The agents, through meetings, train local leaders and hold demonstrations. Good work was done by Butler, Mississippi, Jefferson, Jackson, Dunklin, Scott, and St. Louis Counties.

In the melon-beetle control work the agents arranged for the purchasing of the calcium arsenate-gypsum dust through local dealers. Dusters were obtained and over 2,000 pounds of this dust alone was used in several counties. The beetles were not as serious as in some years, but those who used the dust were repaid with a more uniform stand.

The county agents in 56 counties distributed 35,800 copies of an illustrated circular "Control Garden Pests." Many of the agents held meetings and discussed control methods in connection with other subject-matter work. Newspaper articles also contributed in getting wide adoption of recommended practices. In 77 counties, 23,511 growers reported that they followed insect-control recommendations.

--Annual Report in Entomology,
1937. Missouri.

## Apple Spraying Information

The value of this project to apple growers was emphasized by figures obtained in 338 orchards in 51 counties, which was a representative cross section of the apple industry. The orchards were selected at random. Some of the owners had followed the suggestions exactly, others had used only part of them, or the spraying job had been poorly done, and a few orchards were unsprayed. In 150 completely sprayed orchards the insect injuries totaled 3.3 percent; in 174 partly or poorly sprayed orchards and insect injuries were 15.3 percent; and in 14 unsprayed plantings the average insect damage was 68.2 percent.

This system of measuring results was started by us in 1928. The average insect injury from 1928 to 1937 inclusive, in 1,052 completely sprayed orchards, was 4 percent; in 1,501 incompletely sprayed orchards, 18.6 percent; and in 137 unsprayed orchards, 63.9 percent.

In earlier reports insect damages have been expressed also in terms of monetary valuations. This year the insect losses in 150 completely sprayed orchards amounted to $32,070, out of a yield valued at $1,459,721. In 174 incompletely sprayed orchards having a yield valued at $981,150 the insect losses amounted to $89,400. The apple trees in 14 unsprayed orchards yielded 22,560 bushels of apples, of which 12,412 bushels valued at $6,206 were destroyed by insect attacks.

--Annual Report in Entomology.
1937. Pennsylvania.

## Termite Prevention and Control

As a result of our termite-control work, many county agents are now providing exhibits of termites and termite damage, as a means of furthering the work in their respective counties. In addition, the county agents themselves say that they are now qualified to discuss the problem with those having infested homes. Because of the technical nature of the problem, the agents were previously at a loss to explain details of termite prevention and control.

Eventually the agents will have a complete file of the names of persons adopting control measures, but owing to the newness of the project, this is not yet possible. However, correspondence relative to the subject has increased considerably which leads us to believe permanent results are being accomplished. We feel this to be especially true, because many of the letters came from counties sponsoring termite control and contain requests for further information about the subjects discussed at meetings.

--Annual Report in Entomology.
1937. Indiana.

## TIMELY TOPICS

### Statistics on the Use of Insecticides and Fungicides in the United States, 1936

Statistics on the use of insecticides and fungicides in the United States for 1936 have been published by R. C. Roark (Chemical Industries. Vol. 42, No. 6, pt., 1, pp. 636 - 637, 639, June 1938). In that year 44,000,000 pounds of lead arsenate, 45,000,000 pounds of calcium arsenate, and 3,000,000 pounds of paris green were used. Imports of pyrethrum flowers during the first 11 months of 1937 broke all previous records, amounting to about 18,000,000 pounds. In 1936, 510,337 pounds of derris and 1,829,056 pounds of cube were imported. The demand for practically all insecticides and fungicides has increased greatly during the past 20 years.

### Fine Phenothiazine More Toxic Than Coarse

A cooperative project between the Division of Insecticide Investigations and the Division of Fruit Insect Investigations on the study of the variation of toxicity to codling moth larvae with particle size of different insecticides has revealed some interesting results with phenothiazine. A commercial sample was separated by L. D. Goodhue in a Federal air classifier. The coarse (about 50-70 microns in diameter) and a fine fraction (below 10 microns) were submitted to E. H. Siegler for tests against the codling moth larva. Using 123 plugs, the course fraction allowed 63 percent entries and 2 percent stings. The fine fraction on 141 plugs allowed only 10 percent entries and 2 percent stings. The load deposited on the plugs and the chemical composition was found to be almost identical, according to the analyses by C. C. Cassil. Further evidence of the identical chemical composition of the coarse and fine samples was obtained when each was dissolved in alcohol, re-precipitated, and tested for toxicity in the same way. Treated in this way, the toxicological results were practically the same for both samples.

### Toxicity of Phenothiazine to Poultry Lice

Preliminary tests made by H. E. Parish, of the Menard, Tex., laboratory, show that most of the body lice of chickens are killed in 24 hours and are completely destroyed in 4 days by dusting the birds with phenothiazine.

Phenothiazine is regarded as nonpoisonous to higher animals, but its use is impractical at present because of its relatively high price.

### Derris Powder Effective Against Cattle Lice

R. W. Wells, Ames, Iowa, reports: "It was found that derris powder diluted by tripoli earth to one-sixteenth of 1 percent rotenone is inadequate to kill all the lice, but some dead lice were found. From this test, and in view of the tests performed last year against Linognathus vituli and Trichovectes scalaris, it is concluded that dilution should not be greater than one-eighth of 1 percent rotenone. Because of the small difference in

cost of rotenone content, one-fourth of 1 percent is judged to be the proper dilution for general recommendation. Such a content would compensate for lack of thoroughness in application."

The low toxicity of derris to higher animals, however, makes it perfectly safe to employ powder of higher rotenone content. The main point in cutting the rotenone is to lower cost and encourage farmers to use the powder more freely and generally.

## Wettable Sulphur Apparently Effective in Controlling Cattle Lice

Experiments conducted at the Sonora, Tex., laboratory by O. G. Babcock indicate that 325-mesh wettable sulphur is effective in controlling the long-nosed cattle louse, Linognathus vituli L., when animals are dipped three times at 11-day intervals. Fifty-eight head of cattle were used in these tests, and at the time of the second dipping only a few lice could be found. One very heavily infested cow harbored only a few live female lice on the face and nose. After the third dipping not a single louse could be found on any of the cattle or calves. The strength of the dip was 10 pounds of sulphur to 100 gallons of water.

## Effect of Flooding on Viability of Grasshopper Eggs

C. C. Wilson, Sacramento, Calif., reports that during January, February, and March many alfalfa fields in the Sacramento Valley were under water and that the soil was supersaturated during April and the early part of May. Ten egg pods each of Melanoplus differentialis (Thos.) and M. femur-rubrum (Deg.) were recovered from the supersaturated soil and placed in laboratory cages on May 25. The chorion of the eggs was black and in some cases nearly bursting; however, in less than 10 days 100 percent of the eggs of M. differentialis and 82 percent of the eggs of M. femur-rubrum had hatched, indicating that the excessive moisture had little or no effect on their viability.

## New Facts on Hibernation of Tobacco Flea Bettle

As a result of quantitative sampling of hibernation media for overwintering adults of Epitrix parvula (F.) in several environments in the Oxford, N. C., locality, W. A. Shands and his associates found that far greater numbers of the E. parvula adults, per unit of area, were present in old, undisturbed tobacco fields than in fields of grassland or on the edge of woods. Within the tobacco fields the greatest number of flea beetles were found in the immediate vicinity of the old stalks, and fairly large numbers were found in the dead suckers still attached to such stalks. Formerly it had been believed that the majority of E. parvula adults overwintered along the edges of woodlands.

## Derris Residues on Cabbage

A study has just been completed concerning the amount of derris left on cabbages at the time of harvesting. C. C. Cassil, of the Division of Insecticides, went to the South Carolina truck-crop experiment station at Charleston, S. C., and analyzed cabbages of the grades U. S. No. 1 and U. S. No. 1 Green, which had been treated with five applications of a derris-plus-clay mixture containing 1 percent rotenone, and applications having been made at 7-day intervals. It was found that, whereas one such dusting applied about 23 parts per million, the series of five dustings resulted in an accumulation of only 36 parts per million. An opportune shower gave the chance to demonstrate that nearly 90 percent of the residue was removed by 0.6 inch of rain.

## Another Bark Beetle Found Capable of Transmitting Dutch Elm Disease

W. D. Buchanan, of the Morristown, N. J., laboratory, has carried on an experiment with Scolytus sulcatus Lec. as a vector of the Dutch elm disease fungus. This bark beetle has been found most frequently attacking apple trees but infests also elm. It is sometimes found in elms affected with the Dutch elm disease. Mr. Buchanan artificially contaminated adults of S. sulcatus with the fungus and then placed them in cages with small healthy elm trees. The adults vigorously attacked the twig crotches and the trunks, and the trees later showed wilting and discoloration in the wood. The fungus was later cultured from sections of the trees. The experiment indicates the possibility of the beetle causing healthy trees to become infected, provided it has come in contact with the fungus before attacking such trees.

## Lead Residue on Fruit

Following receipt from the Treasury Department of a statement that investigations by the Public Health Service indicate that the health of consumers will not be endangered by the change, the Secretary of Agriculture has issued notice that the quantity of lead residue permitted on fruits shipped interstate will be raised to 0.025 grain per pound of fruit. The lead tolerance previously enforced under the Food and Drugs Act was 0.018 grain per pound. The tolerances for arsenic and fluorine residue remain unchanged at 0.01 grain per pound.

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